Temperature and input energy dependence of the 946-nm stimulated emission cross section of Nd 3+:YAG pumped by a flashlamp

Abstract :

The thermal effect on the laser transition at 946 nm is investigated. The temperature of the cooling system is verified in the range 2-60°C. A Nd:YAG laser crystal is utilized as a gain medium and is pumped by a newly developed flashlamp. The variable pumping energy is accomplished within the 5-40 J range. The stimulated emission cross section of the 946-nm line is estimated based on the fluorescence spectrum of the Nd:YAG laser. The stimulated emission cross section of the 946-nm line is found to be inversely proportional to the temperature and to the input energy due to the increase of the thermal population at the ground level.